7-1-92

PASSF 12.7.1

COPY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	)	
	)	
PASCO SANITARY LANDFILL	)	AGREED ORDER
	)	
	)	No. DE 92TC-E105
	)	

TO:

Burlington Environmental, Inc.
Pasco Sanitary Landfill, Inc.
Sandvik Special Metals Corporation
Basin Disposal Company
Leonard and Glenda Dietrich
John and Marjorie Dietrich
Burlington Northern Railroad
The Boeing Company
Collier Carbon and Chemical
Crown Cork and Seal Company, Inc.
Freightliner Corporation
Harbor Oil, Inc.
ICI Canada Inc.
Intalco Aluminum Corporation
James River II, Inc.
Kalama Chemical, Inc.
Minnesota Mining and Manufacturing Company (3M Company)
Morton International, Inc.
The O'Brien Corporation
Oregon Cutting Systems Division of BLOUNT, Inc.
PACCAR, Inc.
Precision Castparts Corporation
PPG Industries, Inc.
PureGro Company
Rhone-Poulenc Ag Company
Simpson Timber Company
UARCO Incorporated
Weyerhaeuser Company
Wood Treatment Chemicals Company

Collectively referred to herein as the Potentially Liable Parties ("PLPs").

I.

Jurisdiction

This Agreed Order ("Order") is issued pursuant to the authority of RCW 70.105D.050(1). By execution of this Agreed Order, the PLPs agree to be bound by the terms thereof and not to contest the same, but they do not admit any act, responsibility, fault or liability, or waive any other right, claim, privilege or defense. Compliance with this Agreed Order by any PLP is not conditioned on the performance of any other PLP or group of PLPs. Similarly, the right of the Department of Ecology (Ecology) to enforce this Agreed Order against any PLP is not conditioned on the performance of or enforcement against any PLP or group of PLPs.

II.

Findings of Fact

Ecology makes the following Findings of Fact, without admission of such facts by the PLPs.

A. Site Location

1. The Pasco Sanitary Landfill is located approximately 1.5 miles northeast of the City of Pasco, Washington, in the southwest quarter of Section 15, and the northwest quarter of Section 22, Township 9 North, Range 30 East, Willamette Meridian, in Franklin County, Washington. The site is near the intersection of Kahlotus Road and Washington State Route 16, at latitude 46 degrees, 15' 07" North and longitude 119 degrees, 03' 13" West. The precise location and boundaries of the Site are depicted by the diagram that is Exhibit A to this Order. The Site consists of the area illustrated, and extends laterally and vertically as far as the plume of contamination in ground water resulting from on site contamination.

B. Site History and Operations

1. In 1958, the Franklin County Planning Commission authorized John Dietrich, d/b/a Pasco Garbage Service, to establish and operate a garbage disposal facility at this site. The facility operated as a burning dump until 1971, when it converted to a sanitary landfill.

2. Chemical Processors, Inc. (Chempro), and John and Marjorie Dietrich, d/b/a Basin Disposal Co. (Basin), Inc., agreed in 1972 to form a third company, Resource Recovery Corporation, (CR2) to operate the landfill. CR2 was incorporated in Washington on August 8, 1972. The Resource Recovery Corporation Operational Plan, dated August 28, 1972, envisioned the development of a landfill for both drummed and liquid wastes. Drummed wastes were to be buried, and bulk liquids were to be discharged to lagoons and evaporated.

3. Ecology issued an industrial waste discharge permit, no. 5301, to CR2 on March 21, 1973, to govern the operation of the disposal facility according to the operational plan. CR2 operated the industrial waste lagoons and drum disposal sites until 1974. An inventory of known wastes, and their locations, is included in Exhibit B to this Order.

4. Following expiration of the permit, CR2 continued to operate the sanitary landfill portion of the facility, accepting local solid and industrial waste under permit from the BFHD. In 1981, Pasco Sanitary Landfill, Inc. (PSL), was formed to operate the landfill. PSL is now wholly owned by Larry Dietrich. PSL continues to aceept municipal waste from public and private entities in the Pacific Northwest.

C. **Previous Site Investigation Results**

1. Monitoring results to date indicate a release of hazardous substances to the environment, within the meaning of RCW 70.105D.020, has occurred at the site. For example, Volatile Organic Compounds discovered in ground water, and their maximum concentrations to date, include:

- 1,1 Dichloroethylene, at a maximum concentration of 250 micrograms per liter (35 times the federal maximum contaminant level);

- 1,1 Dichloroethane, at a maximum concentration of 739 micrograms per liter;

- Trans-2 Dichloroethylene, at a maximum concentration of 190 micrograms per liter;

- Vinyl Chloride, a human carcinogen, at a maximum concentration of 7082 micrograms per liter (3541 times the federal maximum contaminant level);

- Chloroform, at a maximum concentration of 703 micrograms per liter;

- 1,1,1 Trichloroethane, at a maximum concentration of 2680 micrograms per liter (13 times the federal maximum contaminant level);

- Trichloroethane, at a maximum concentration of 1880 micrograms per liter (376 times the federal maximum contaminant level);

- Tetrachloroethylene at a maximum concentration of 112 micrograms per liter (22 times the federal maximum contaminant level);

- Toluene, at a maximum concentration of 4470 micrograms per liter (4 times the federal maximum contaminant level); and

- total Xylenes at a maximum concentration of 2850 micrograms per liter.

2. In February, 1990, the Pasco Sanitary Landfill was listed as a National Priority List (NPL) site by the United States Environmental Protection Agency (EPA). The Department of Ecology (Ecology) has been established as the lead agency for the cleanup investigations and remedial actions taken at the site.

3. Studies germane to the site investigations include, but are not limited to:

Washington Department of Ecology, 1973: Resource Recovery Corporation Industrial Disposal Site Evaluation

Ecology and Environment, Inc., 1985: Preliminary Site Inspection Report of Resource Recovery Corporation, Pasco, Washington; Prepared under U.S. Environmental Protection Agency Contract No. 68-01-6692, Technical Directive Document No. R10-8408-22

Ecology and Environment, Inc., 1986: Final Report for Resource Recovery Corporation, Pasco, Washington; Prepared under U.S. Environmental Protection Agency Contract No. 68-01-6692, Technical Directive Document No. R10-8410-14

Ecology and Environment, Inc., 1987: Field Investigation Report for Pasco Sanitary Landfill/Resource Recovery Corporation, Pasco, Washington; Technical Directive Document No. F10-8701-04

JUB Engineers, 1981: Evaluation of the Pasco Sanitary Landfill Waste Disposal Practices

JUB Engineers, 1983: Summary Report, Ground Water Quality in the Vicinity of the Pasco Landfill

United States Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, 1990: Preliminary Health Assessment for the Pasco Sanitary Landfill, Pasco, Franklin County, Washington, CERCLIS No. WAD991281874

United States Environmental Protection Agency, 1987: Letter from Marcia Knadle, EPA Hydrogeologist Region X to Flora J. Goldstein, Regional Hydrogeologist, Washington Department of Ecology

Technico and Environmental Services, Inc, 1991: Pasco Sanitary Landfill Permit Application

D. Conclusions

Based upon the information and data generated to date, the public may be at risk because of the potential for hazardous substances to migrate through the ground water to wells used as a potable water source, irrigation, or other beneficial uses. The extent of ground water, air, and soil contamination has not been fully identified. Based upon the facts set forth herein, Ecology has determined that the release and potential release of hazardous substances from the facility require remedial action to protect the public health, welfare, and the environment. This Order sets forth the remedial measures necessary to protect public health, welfare, and the environment.

III.

Ecology Determinations

1. Each PLP is liable pursuant to RCW 70.105D.040 for the Pasco Sanitary Landfill, which is a "facility" as defined in RCW 70.105D.020(3).

2. The facility is known as The Pasco Sanitary Landfill and is located approximately 1.5 miles northeast of the City of Pasco, Washington, in the southwest quarter of Section 15, and the northwest quarter of Section 22, Township 9 North, Range 30 East, Willamette Meridian, in Franklin County, Washington. The site is near the intersection of Kahlotus Road and Washington State Route 16, at latitude 46 degrees, 15' 07" North and longitude 119 degrees, 03' 13" West.

3. The substances found at the facility as described above are "hazardous substances" as defined at RCW 70.105D.020(5).

4. Based on the presence of these hazardous substances at the facility and all factors known to the Department, there is a release or threatened release of hazardous substances from the facility, as defined at RCW 70.105D.020(10).

5. By letters issued pursuant to WAC 173-340-500(4), Ecology notified each of the PLPs of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that the PLPs take the following remedial actions to implement the scope of work ("SOW"), attached as Exhibit C, and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

1. Within thirty (30) days of the effective date of this order, the PLPs shall submit to Ecology a proposed work plan to implement the scope of work, included as exhibit C of this document. The work plan shall consist of a detailed breakdown of the scope of work, personnel requirements, project costs, and schedules for the Phase I Remedial Investigation, including the following elements thereof.

a. Health and Safety Plan

b. Data Management Plan

c. Sampling and Analysis Plan, including a Field Sampling Plan, Quality Assurrance Project Plan, and Investigative Waste Management Plan

d. Public Participation Plan.

The work plan and each element thereof shall be designed, implemented and completed in accordance with the National Contingency Plan (NCP), in effect on the effective date of this Order, and as amended, and in accordance with the requirements of CERCLA as amended by SARA, the Model Toxics Control Act (Ch.70.105D RCW) and regulations (Ch. 173-340 WAC) as may be amended, all applicable federal and state laws and regulations and all applicable EPA guidance documents, including, but not limited to EPA 540/G-89/004 Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA; and, EPA 540/P-91/001 Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites.

2. Within forty-five (45) days after receipt of the work plan Ecology shall notify the PLPs, in writing, of Ecology's approval or disapproval of the work plan. In the event of any disapproval, Ecology shall specify, in writing, both the deficiencies and any Ecology recommended modifications regarding the work plan.

3. Within fifteen (15) days of the receipt of Ecology's notification of the work plan disapproval or recommended modification, the PLPs shall amend and submit to Ecology a revised work plan incorporating the modifications required by Ecology.

4. Within fifteen (15) days of the final approval of the work plan, the PLPs shall commence work and thereafter complete all tasks by the dates indicated in the approved schedule. The approved work plan and schedule shall be attached to and incorporated into this Order, and shall thereafter be an integral and enforceable part of this Order.

5. Progress reports shall be completed on a monthly basis. The reports shall include an estimate of percent complete for eash task or subtask identified in the scope of work, address progress made during the period, work in progress, problem areas, key activities and scheduling, deliverables submitted, field work and data generated, subcontracting, analytical services performed, and key staff changes.

6. In accordance with WAC 173-340-840(5), sampling data shall be submitted according to GROUNDWATER SAMPLING DATA SUBMITTAL REQUIREMENTS. These submittals shall be provided to Ecology as required under the schedule established in provision 4, above.

V.

Terms and Conditions of Order

1. Definitions. Unless otherwise specified, the definitions set forth in ch. 70.105D RCW and ch. 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notices. RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to propose amendments to or withdraw from this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs. The PLPs shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities; e.g., employee salary, laboratory costs, travel costs, contractor fees, and employee benefit packages; and agency indirect costs of direct activities. The PLPs shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of an itemized statement of costs may result in interest charges.

4. Designated Project Coordinators. The project coordinator for Ecology is:

Guy J. Gregory
Hydrogeologist
Toxics Cleanup Program
State of Washington
Department of Ecology
N. 4601 Monroe, Suite 100
Spokane, WA 99205-1295

The project coordinator for the PLPs is:

Ms. Marlys S. Palumbo
Burlington Environmental Inc.
2203 Airport Way South, Suite 400
Seattle, WA 98134-2027

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and the PLPs, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or the PLPs change project coordinator(s), written notification shall be provided to Ecology or the PLPs at least ten (10) calendar days prior to the change.

5. Performance. All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. the PLPs shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site.

Except where necessary to abate an emergency situation, the PLPs shall not perform any remedial actions at Pasco Sanitary Landfill outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

6. Access. Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by the PLPs. By signing this Agreed Order, the PLPs agree that this Order constitutes reasonable notice of access, and agrees to allow access to the Site at all reasonable times for purposes of overseeing work performed under this Order. Ecology shall allow split or replicate samples to be taken by the PLPs during an inspection unless doing so interferes with Ecology's sampling. The PLPs shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity.

7. Public Participation. The PLPs shall prepare and/or update a public participation plan for the site. Ecology shall maintain the responsibility for public participation at the site. The PLPs shall help coordinate and implement public participation for the site.

8. Retention of Records. The PLPs shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of the PLPs, then the PLPs agree to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

9. Reservation of Rights/No Settlement. This Agreed Order is not a settlement under ch. 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against the PLPs to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against the PLPs to require those remedial actions required by this Agreed Order, provided the PLPs comply with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Site should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from Pasco Sanitary Landfill.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order the PLPs to stop further implementation of this Order for such period of time as needed to abate the danger.

10. Transference of Property. No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by the PLPs without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest any of the PLPs may have in the site or any portions thereof, the PLPs shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, the PLPs shall notify Ecology of the contemplated transfer.

11. Compliance with Other Applicable Laws.

a. All actions carried out by the PLPs pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements.

b. PSL agrees that operations on the site will comply with its current operating permit and all applicable federal, state, and local laws and regulations.

12. Amendment. Ecology and the PLPs may amend this Order and its Scope of Work by mutual agreement, pursuant to WAC 173-340-530(7).

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon the PLPs receipt of written notification from Ecology that the PLPs have completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with.

VII.

Enforcement

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

   a. The Attorney General may bring an action to enforce this Order in a state or federal court.

   b. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

   c. In the event the PLPs refuse, without sufficient cause, to comply with any term of this Order, the PLPs will be liable for:

      (1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and

      (2) civil penalties of up to $25,000 per day for each day it refuses to comply.

   d. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70.105D.060.

Dated this 1 day of ~~June~~ July 1992.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By: Flora J. Goldstein

Flora J. Goldstein
Section Manager
Toxics Cleanup Program
Eastern Regional Office

POTENTIALLY LIABLE PARTY

Dated this 26th day of June, 1992.

By: Marilyn S. Palumbo

For: BurlingtonEnvironmental Inc.

As: Vice President & General Counsel

POTENTIALLY LIABLE PARTY

Dated this 25 day of June, 1992.

By: [signature]

For: Waste Systems Landfill Inc.

As: President

POTENTIALLY LIABLE PARTY

Dated this 25th day of June, 1992.

By: _____
Kirk Galbraith

For: Sandvik Special Metals Corporation

As: President and CEO

POTENTIALLY LIABLE PARTY

Dated this 19 day of June, 1992.

By: James Sells

For: Basin Disposal

As: attorney

POTENTIALLY LIABLE PARTY

Dated this 19 day of June, 1992.

By: _____

For: Leonard Wendy Rietman

As: _____

POTENTIALLY LIABLE PARTY

Dated this 19 day of June, 1992.

By:

For: John/Marjorie Dutch

As: attorney

POTENTIALLY LIABLE PARTY

Dated this 25TH day of June, 1992.

By: _____

For: Burlington Northern Railroad

As: Attorney

POTENTIALLY LIABLE PARTY

Dated this 24th day of June, 1992.

By: [signature]

For: The Boeing Company

As: Corp Director of Environmental Affairs

POTENTIALLY LIABLE PARTY

Dated this 25th day of June, 1992.

By: C. F. Merrill 25 June 92

For:* _____

As: Group Vice President

* Unocal Chemicals & Minerls Division, Union Oil Company of California dba Unocal as sucessor in interest to Collier Carbon & Chemical COmpany

POTENTIALLY LIABLE PARTY

Dated this 24th day of June, 1992.

By: William T. Gallagher

For: Crown Beverage Packaging, Inc.
(successor to Continental Can Company, Inc.)

As: Attorney

POTENTIALLY LIABLE PARTY

Dated this 16 day of June, 1992.

By: James T. Hubler

For: James T. Hubler

Freightliner Corporation

As: Freightliner Corporation

Senior Vice President

POTENTIALLY LIABLE PARTY

Dated this 25th day of June, 1992.

By: [signature]

For: HARBOR OIL, INC

As: CHAIRMAN/CEO

POTENTIALLY LIABLE PARTY

Dated this 29th day of June, 1992.

By: S.L. [signature]

For: ICI CANADA INC

As: Corporate Secretary

POTENTIALLY LIABLE PARTY

Dated this 23rd day of June, 1992.

By: James N. Frederick

For: Intalco Aluminum Corporation

As: Sr. Vice President & Works Manager

POTENTIALLY LIABLE PARTY

Dated this 23 day of June, 1992.

By: _____
Andrew G. Elsbree

For: JAMES RIVER II, Inc.

As: Vice President and
Resident Manager, Camas Mill

POTENTIALLY LIABLE PARTY

Dated this 25th day of June, 1992.

By: [signature]

For: KALAMA CHEMICAL, INC.

As: VICE PRESIDENT

POTENTIALLY LIABLE PARTY

Dated this 23 day of June, 1992.

By: _____

For: Minnesota Mining and Manufacturing Company

As: Director

POTENTIALLY LIABLE PARTY

Dated this 25 day of June, 1992.

By: Walawski

For: Morton International, Inc.

As: Dir., Environmental Affairs

POTENTIALLY LIABLE PARTY

Dated this 23 day of June, 1992.

By: Patricia Houle

For: THE O'BRIEN CORPORATION

As: CORPORATE ENVIRONMENTAL MANAGER

POTENTIALLY LIABLE PARTY

Dated this 25 day of June, 1992.

By: _____

For: James S. Osterman

As: President
Oregon Cutting Systems
Division of Blount Inc.

POTENTIALLY LIABLE PARTY

Dated this 23rd day of June, 1992.

By: Hillary Tapla

For: PACCAR Inc.

As: Counsel

POTENTIALLY LIABLE PARTY

Dated this 29th day of June, 1992.

By: Dan Kathmann

For: Precision Castparts Corp

As: Environmental Affairs Mgr.

POTENTIALLY LIABLE PARTY

Dated this 26th day of June, 1992.

By: Joseph M. Karas

Joseph M. Karas

For: PPG Industries, Inc.

As: Senior Attorney

POTENTIALLY LIABLE PARTY

Dated this 25th day of June, 1992.

By: _____ R25jun92

R. W. Ustick

For: PureGro Comapny

As: President

POTENTIALLY LIABLE PARTY

Dated this 26 day of June, 1992.

By: W C Collins [signature]

For: Rhone-Poulenc Ag Company

As: Vice President & General Mgr. - Operations

AGREED ORDER No. DE 92TC-E105

POTENTIALLY LIABLE PARTY

Dated this 22nd day of June, 1992.

By: J. T. Rasch

For: SIMPSON TIMBER COMPANY

As: VICE PRESIDENT & CHIEF FINANCIAL OFFICER

POTENTIALLY LIABLE PARTY

Dated this 23rd day of June, 1992.

By: [signature]

For: ARCO INCORPORATED

As: V. P. & General Counsel

POTENTIALLY LIABLE PARTY

Dated this 23rd day of June, 1992.

By: [signature]

For: Weyerhaeuser Co.

As: Remediation Mgr.

POTENTIALLY LIABLE PARTY

Dated this 26 day of June, 1992.

Reference Pasco Sanitary Landfill

By: Michael F. Weishaar

For: Wood Treatment Chemicals Co.

As: Manager, Remedial Projects

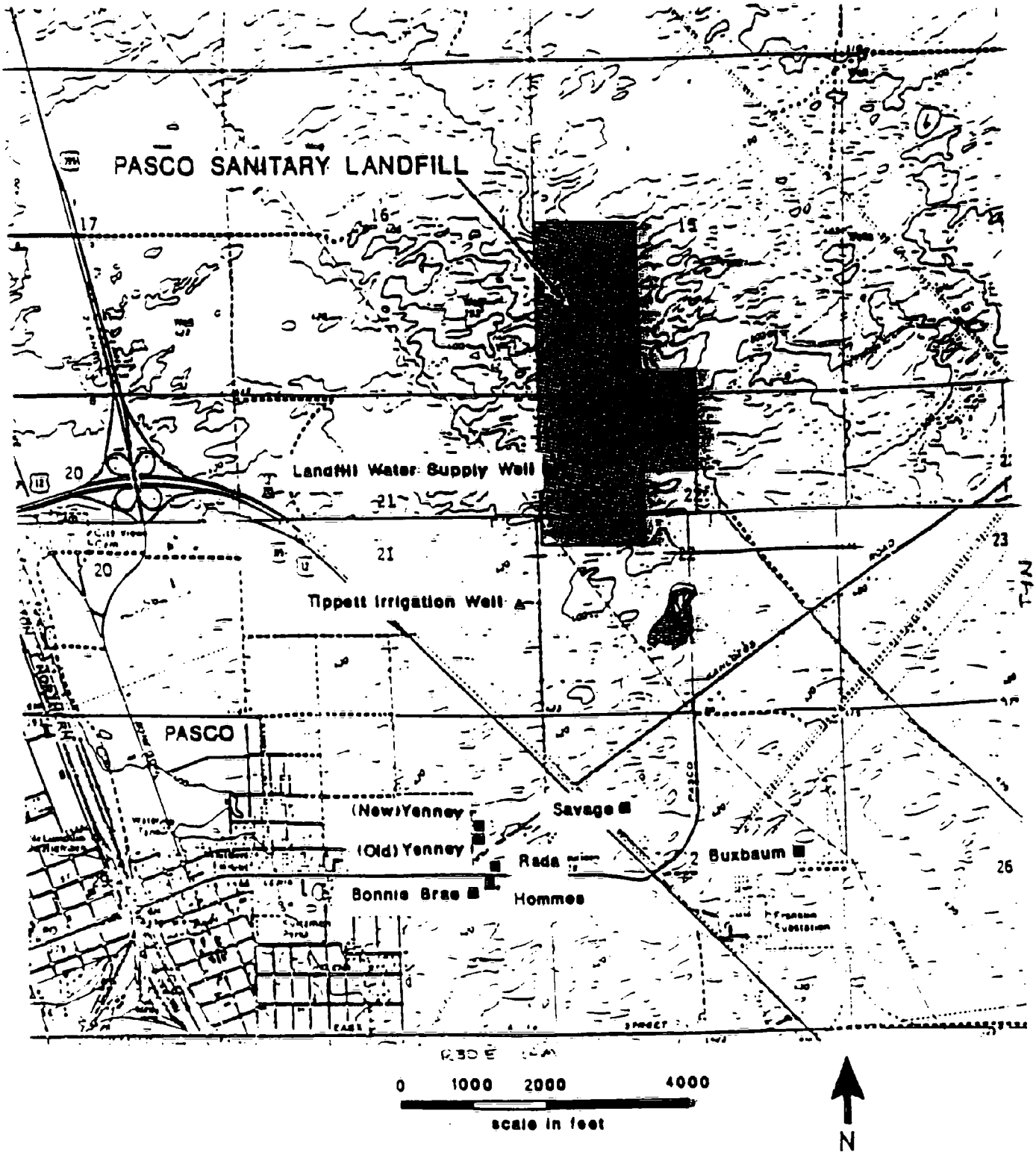

EXHIBIT "A"
LOCATION MAP, PASCO SANITARY LANDFILL

EXHIBIT "B"

WASTE QUANTITES DISPOSED OF AT PASCO SANITARY LANDFILL
BY RESOURCE RECOVERY CORPORATION

Location(5)	Description(7) (Size*/Lining)	Waste Type(2,8)	Estimated Quantity (2,5,8)	Units
Site A	100'x100' bottom unlined top lined	acids	544	drums
		aromatic tars	160-248	drums
		carcinogenics (unspecified)	3	drums
		caustics	8,774	drums
		cadimum	11	drums
		metal finishing	244-304	drums
		oil sludge	433	drums
		paint	10,258-24,200	drums
		pesticides	425	drums
		pesticide containers (empty)	791-863	drums
Site B	50'x50' bottom unlined top lined	2,4-D manufacturing	2,011-5,080	drums
Site C	75'x75' bottom unlined top lined	acids	7,000	gallons
		acid metal cleaning	2,301,560	pounds
		lime phenol	684,967	gallons
		metal cleaning	185,162	gallons
		metal finishing	17,000-35,724	gallons
		metal finishing	1,460,602-1,949,652	pounds
Site D	75'x75' bottom unlined top lined	aromatic tar	499,270	pounds
		cutting oil	76,350-84,300	gallons
		fertilizer manufacturing	228,288	pounds
		oily sludge	6,000-66,340	gallons
		paint	72,475-497,418	pounds
		paint	66,516-95,711	gallons
		plywood resin	1,393,380-2,215,440	pounds
		solvents	12,648	gallons
Site E	unknown bottom and top lined	barium with mercury	10,500-11,582	tons
Unknown	unknown	acid sludges	1,000	gallons
		acid wash solution	312,350	pounds
		benzoic acid and tar	176,000	pounds
		chemistry lab reagents	1	drum
		chrome rinse water	700,901	pounds
		DCP tar	8,790	gallons
		etching solution	1,914	barrels
		lime sludge	80-160	drums
		MCPA bleed	104,318-327,000	gallons
		MCPA tar	2,965-3,037	drums
			939	drums
			2,813	barrels
			680	pails
		metal casing wastes	3,300-5,760	drums
		misc. lab chemicals	29	sm. containers
		NH_4+ and NaOH chemical solutions	17,238	gallons
		oily sludge	166,680	pounds
		other miscellaneous	435	drums
		pesticide containers	1,045	each
		resin manufacturing	992,553	gallons
		solid caustic soda	44,550	pounds
		wood treatment/preservative	294,662	gallons
			238	drums

EXHIBIT "C"

PROPOSED WORK SCOPE PASCO LANDFILL PHASE I REMEDIAL INVESTIGATION

May 1992

Prepared for:

Pasco Landfill PLP Group

Project 624419

Prepared by:

BURLINGTON ENVIRONMENTAL INC.
Technical Services
7440 West Marginal Way South
Seattle, Washington 98108-4141
(206) 767-3306

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SCOPE OF WORK

2.1 Project Scoping

All work in this investigation phase of the project will be conducted under the authority of MTCA, Chapter 70.105D RCW and Chapter 173-340 WAC. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) guidance will be used to ensure that the investigation and cleanup meets CERCLA criteria.

The scoping tasks identified for this project include Data Review and Analysis, Preliminary Conceptual Site Model Development, and Development of Remedial Action Objectives and Alternatives. These tasks are necessary so that the work plan elements will be focused toward a remedial solution and will avoid duplication in data collection. These tasks are more fully described below and in the EPA Remedial Investigation/Feasibility Study (RI/FS) Guidance Document (Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, EPA, 1988).

2.1.1 Data Review and Analysis

The Burlington Environmental Inc. (Burlington) project team will expand on the previous review and analysis of existing data with the following major objectives in mind:

- summarize the site history including:
  - data related to the varieties, quantities, and timing of materials disposed and the operating procedures;
  - ownership history; and
  - waste generation, treatment, storage, and disposal activities.

1 INTRODUCTION

This document presents the scope of work and project schedule for completing a Phase I Remedial investigation for the Pasco Landfill in Pasco, Washington. The purpose of this investigation is to gain additional information on the nature and extent of contamination in the air, soil, and groundwater near potential contaminant sources at the Pasco Landfill. This work is being completed at the request of the Potentially Liable Person (PLP) Group, which includes: past and present owners/operators and generators.

In accordance with the United States Environmental Protection Agency (EPA) and Washington Department of Ecology (Ecology) Superfund/Hazardous Waste Cleanup Memorandum of Agreement, Ecology will be the lead agency for this site. Therefore, cleanup actions will be conducted under the authority of the Washington Model Toxics Control Act (MTCA), Chapter 70.105D RCW and accompanying regulations Chapter 173-340 WAC.

2.1.3 Develop Preliminary Conceptual Site Model

The Preliminary Conceptual Site Model (PCSM) is used to describe the types of contaminants at the site, media known to be affected, potential migration and exposure pathways, and a preliminary assessment of potential risk to human health and the environment. The PCSM will be the basis for completing the remaining tasks in this phase of the project.

The elements of this PCSM are:

- populations and environmental concerns at risk;
- routes of exposure;
- hazardous properties, environmental fate, and form of the contaminants of concern;
- hydrogeologic factors;
- climate;
- extent to which the source(s) can be adequately identified and characterized; and
- preliminary identification of Applicable or Relevant and Appropriate Requirements (ARARs) and the extent to which contamination levels exceed the preliminary ARARs.

Burlington's proposed approach to each of these elements of the PCSM is discussed below.

2.1.3.1 Population and Environmental Concerns at Risk

Completion of this element will include obtaining the 1990 U.S. census data for the Pasco area. Pertinent census information includes population within a one mile and four-mile radius

- evaluate the construction of the current monitoring well network for adequacy in this investigation;

- evaluate the extent, quality, and implications of the available analytical database for indications of site contamination;

- identify those areas where the database contains insufficient data or warrants additional data gathering efforts to fulfill the requirements of this phase of work; and

- document existing environmental controls that have been constructed (e.g. landfill gas venting system, caps, et. cetera).

Should this data review indicate that revisions to the work scope are appropriate, the Pasco Landfill PRP Group will be informed.

2.1.2 Site Visit

Once Burlington has completed a review of the available data base, the project manager and other appropriate project team members visit the site and meet with the Pasco Landfill PLP Group to conduct a detailed site reconnaissance. Having completed the review of the existing database, Burlington can view the site with knowledge of areas of known contamination and their relationship to potential environmental receptors, and of areas where the current data base may be insufficient. Discussions will be held with the Pasco Landfill PLP Group at that time to discuss Burlington's summarization of the existing database and the proposed work scope.

2.1.3.3 Hazardous Properties, Environmental Fate, and Form of the Potential Contaminants of Concern

The chemical and physical properties and environmental fate data for several primary contaminants of concern will be obtained from one of several sources including Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites (EPA, 1985). Additional information about the fate of contaminants in groundwater may be obtained from Water-Related Environmental Fate of 129 Priority Pollutants (EPA, 1979).

2.1.3.4 Hydrogeologic Framework

Results of the existing data evaluation (Section 2.1.1) will be applied here. Burlington will also use other sources of published studies on the regional hydrogeology such as WDOE, the Washington Department of Natural Resources, and the U.S. Geological Survey (USGS), should this be necessary. Municipal and other local well records will be obtained and reviewed to evaluate the use of groundwater in the immediate site area.

After reviewing all collected sources of groundwater information, Burlington will provide the conceptual site hydrogeological framework, which will include geologic, hydraulic, and groundwater use aspects of the site.

2.1.3.5 Climatic Factors

We believe climatic data as compiled by the National Oceanic and Atmospheric Administration (NOAA) is readily available and of sufficient detail for the PCSM.

of the site and the percentage of elderly and children in the population. Appropriate local agencies, including the Tri-City Industrial Development and Economic Council (Tridec), would be contacted to acquire more detailed information concerning the population distribution and the presence of sensitive subpopulations. Recreational, commercial, and tribal uses of the Columbia and Snake Rivers could also be evaluated, as needed.

The Pasco Community Development Department, Franklin County Planning Department, and Tridec would be contacted to obtain information concerning any planned or anticipated changes in land use in the site environs. This information would be useful for the evaluation of current and future land use in a future risk assessment.

To evaluate the proximity of the site to ecologically sensitive populations, Burlington will contact the WDOE to obtain wetlands inventory maps for the Pasco area within a one-mile radius of site. The Washington Department of Wildlife will be contacted regarding the presence of any threatened or endangered species in the area.

2.1.3.2 Exposure Pathways

Exposure pathways are composed of three basic elements: a source of a hazardous substance, a mechanism for its release and transport in the environment, and a human or environmental receptor. Potential human and environmental receptors may include nearby residents, site workers, aquatic life in the Columbia and Snake Rivers, groundwater users, and persons fishing at the Columbia and Snake Rivers. A potential exposure pathway to be included is ingestion of agricultural products grown in contaminated soil or irrigated with contaminated groundwater.

There are two primary mechanisms for the transport of contaminants from soil to the air--volatilization and dispersion, and resuspension of dusts and subsequent dispersion. The potential for generation of appreciable quantities of dusts is highly dependent on site-specific features such as the presence of landfill vegetative cover, asphalt or gravel, and soil type.

Table 1

POTENTIAL ARARS

PASCO LANDFILL
PASCO, WASHINGTON

Statutes and Regulations
FEDERAL
Comprehensive Environmental Response, Compensation, and Liability Act (P.L. 96-510)
Clean Air Act (42 USC 7401)
Clean Water Act (42 USC 1251)
Department of Transportation Rules for the Transportation of Hazardous Materials (49 CFR 107, 171.1-172.558)
Endangered Species Act of 1973 (16 USC 1531, 50 CRF 18, 225, 402)
National Oil and Hazardous Substances Contingency Plan (40 USC 300)
Occupational Safety and Health Act of 1970 (29 USC 651)
OSHA requirements for workers engaged in emergency response or other hazardous waste operations (29 CFR 1910.120)
Resource Conservation and Recovery Act (42 USC 6921)
Safe Drinking Water Act (42 USC 30 (f))
Superfund Amendments and Reauthorization Act (P.L. 99-499)
Toxic Substances Control Act (15 USC 2601)
STATE
Washington Solid Waste Regulations (WAC Title 173, Chapter 304)
Washington Solid Waste Management Law (RCW Title 70, Chapter 95)
Washington Water Pollution Control (RCW Title 90, Chapter 48)
Washington Hazardous Waste Disposal (RCW Title 70, Chapter 105)
Washington Dangerous Waste Regulations (WAC Title 173, Chapter 303)

2.1.3.6 Extent to Which the Source can be Adequately Identified and Characterized

The review of all existing site reports will be completed to confirm the previously-identified sources and to evaluate the adequacy of existing data to characterize these sources. Descriptions of source characterization will likely include vertical and areal extent of contamination and contaminant concentration distribution. The site reports, all historical information regarding landfill operations including available site aerial photographs and the current site monitoring network, will be reviewed to identify additional potential sources of contamination and determine the extent to which these potential sources can be characterized.

2.1.3.7 Preliminary Identification of Applicable or Relevant and Appropriate Requirements (ARARS)

Pursuant to the PCSM, the list of preliminary chemical-specific and location-specific ARARs shown in Table 1 will be reviewed to identify which standards and controls may have bearing on any remedial actions taken at the site. The list of ARARs will be more fully developed and evaluated in the Preliminary Risk Assessment.

2.1.4 Identify Remediation Objectives and Alternatives

Generally, preliminary remedial action objectives are aimed at protecting human health and the environment. These preliminary objectives are based on the PCSM. Specifically, the contaminants of concern, the exposure pathways and receptors, and the extent to which contaminant levels exceed the acceptable level or range of levels identified in the preliminary ARARs as evaluated in the PCSM are used to develop the preliminary remedial action objectives.

2.2.1 Base Map

A base map will be prepared using the topographic map generated by the Pasco Sanitary Landfill from a December 1991 aerial survey. This map as well as other maps of figures required will be consistent with WAC 173-340-840(4).

...2 Work Plan

The work plan will define the project scope of work and will be based on data needed for the initial site characterization. Following EPA guidance, the work plan will include the following five elements:

- Introduction - A general explanation of the reasons for, and the expected results or goals of, the investigation process are presented;
- Site Background and Physical Setting - The current understanding of the physical setting of the site, the site history, and the existing information on the condition of the site are described;
- Initial Evaluation - The conceptual site model developed during scoping is presented, describing the potential migration and exposure pathways and the preliminary assessment of human health and environmental impacts;
- Work Plan Rationale - Data requirements, based on the findings of the PCSM, are documented, and the work plan approach is presented to illustrate how the activities will satisfy data needs; and
- Investigation Tasks - The tasks to be performed during this phase of the investigation are presented in detail.

MTCA and CERCLA express a clear preference for permanent technologies that minimize the amount of untreated hazardous substances remaining at the site. In order of descending preference, the following technologies shall be considered:

- reuse or recycling;
- destruction or detoxification;
- separation or volume reduction followed by reuse, recycling, destruction, or detoxification of the residual hazardous substances;
- immobilization;
- on-site or off-site disposal;
- isolation or containment;
- institutional controls and monitoring;
- a combination of above technologies; and
- no action.

An evaluation of the need for interim actions (or data requirements to determine the need) for interim actions will also be completed under this section.

2.2 Site Investigation Planning Documents and Maps

The culmination of the project scoping process is the preparation of planning documents that make up the work plan. These plans are also described in detail in the general RI/FS guidance (EPA, 1988). Additionally, accurate maps are required for depicting locations described within the planning documents.

- quality assurance objectives;
- sampling procedures;
- sample custody and documentation;
- calibration procedures and frequency;
- analytical procedures;
- data reduction, validation, and reporting;
- laboratory quality control checks;
- performance and system audits;
- preventative maintenance;
- procedures to assess precision, accuracy, and completeness;
- corrective action; and
- reporting.

2.2.3.2 Field Sampling Plan

The FSP will provide requirements and procedures for the following topics:

- sampling objectives;
- sample location and frequency;
- sample designation;
- sampling equipment and procedures; and
- sample handling and analysis.

2.2.3 Sampling and Analysis Plan

The Sampling and Analysis Plan (SAP) consists of three parts:

- a quality assurance project plan (QAPP) that describes the policy, organization, functional activities, and quality assurance and quality control protocols necessary for the intended use of the data;
- the field sampling plan (FSP) that provides guidance for all fieldwork by defining in detail the sampling and data-gathering methods to be used on a project; and
- an investigative wastes management plan (IWMP) that addresses handling and disposal of purge and development water, soil boring cuttings, decontamination water, and other investigation-derived wastes.

The SAP will be used by tasks managers and field and laboratory personnel to provide consistency in sample collection, documentation, and handling. Modifications may be made to the sampling and analysis plan during the investigation when those changes increase the resulting data effectiveness. These modifications will be in the form of amendments and will provide the same level of detail in the descriptions of location, methodology, documentation, and handling as in the original plan. The QAPP, SAP and IWMP are further defined below.

2.2.3.1 Quality Assurance Project Plan

The QAPP will provide guidance on sample handling and analysis, data validation and reduction, and analytical laboratory methods, controls, documentation, and corrective measures. The QAPP will provide requirements and procedures for the following topics:

- medical surveillance requirements, activities, and documentation;
- health and safety personnel identification and description of responsibilities;
- emergency response plan that incorporates existing facility response procedures; and
- description of the requirements of on-site health and safety meetings and hazard communications.

2.2.5 Data Management Plan

Burlington will develop a data management plan that will include collection and review of all relevant analytical data obtained from previous sampling of soil and groundwater at the site. All sampling locations will be referenced to an appropriate site-specific coordinate system. This coordinate system will be used later for further describing the areal distribution of possible site contamination or for formulating cost-effective remedial strategies and mapping the extent of noncontaminated areas. It is expected that the existing landfill site coordinate system will be used.

The collected analytical data and the descriptions of the physical locations of the samples will be input to the Burlington computerized data management system. The essential features of this system are described in Appendix A.

Our experience indicates that the use of data management plans similar to that shown in Appendix A can provide high quality documentation essential for justifying conclusions and recommended remedial actions. Following completion of all of the outlined data quality assurance procedures, the data will be available for review, tabulation, and statistical analysis. Burlington uses software produces of the Statistical Analysis System (SAS) Institute for data analyses. The SAS software is fully supported by the SAS Institute and quality assured by an

2.2.3.3 Investigative Wastes Management Plan

The IWMP will provide procedures for managing and disposing of wastes generated during field investigations. At a minimum, procedures for disposition of the following wastes will be included:

- soil cuttings and soil cuttings slurries from borings and monitoring wells;
- development water from monitoring wells;
- purge water from monitoring wells;
- pumping test water;
- personal protective materials; and
- decontamination water.

2.2.4 Health and Safety Plan

A Health and Safety Plan (HASP) will be prepared that meets or exceeds the hazardous waste operations and emergency response requirements of 29 CFR 1910.120 (Federal Register, 12/19/86) as well as requirements of the Washington Industrial Safety and Health Act (WISHA). The HASP will be a general plan and series of specific addenda that describe health and safety activities related to all site work. The following items will be included in the HASP as required in either 29 CFR 1910.120:

- material safety data sheets (MSDS) for all materials and compounds brought on site by Burlington that require MSDS;
- standard operating procedures for many on-site activities;

2.3 Site Characterization

The following sections provide a summary for the site characterization efforts in this investigation.

2.3.1 Project Setup/Mobilization

This task includes mobilization of staff and equipment to the site, and establishing field office and support areas. The field office will consist of an office trailer with telephone, copy machine, and health and safety equipment. The support areas will consist of a supply trailer, a temporary fenced yard to secure well materials and other valuable equipment, a personnel shower trailer, and an equipment and personnel decontamination pad.

During all intrusive work related to this investigation, field screening using photoionization equipment such as a TIP or Hnu, and any other appropriate screening device will be conducted. The required screening equipment and intervals will be specified in the site-specific health and safety plan.

2.3.2 Site Survey/Cell Location Verification

Concurrent with site setup and mobilization, an engineering survey of each of the operable units and existing monitoring wells will be completed. Burial Zones A through E were surveyed at the time of closure in 1975. This survey data will be used for ground verification, with semi-permanent markers being set at the corners of the zones. This data will be plotted on the base map of the site and will be used as a starting point for the geophysical survey

international users group. Data reports to Ecology will follow procedures established within Cleanup Information Memorandum No. 91-1, Groundwater Data Submittals (July 12, 1991).

2.2.6 Public Participation Plan

A Public Participation Plan will be prepared that meets the requirements of WAC 173-340-600. The plan will include the following information:

1 Applicable public notice requirements and how these will be met, including: when public notice will occur; the length of the comment periods accompanying each notice; the potentially-affected vicinity and any other areas to be provided notice, to the extent known;

2 Information repositories. The plan should identify at least one location where the public can review information about the remedial action. Multiple locations may be appropriate;

3 Methods of identifying the public's concerns. Such methods may include: interviews; questionnaires; meetings; contact with community groups or other organizations which have an interest in the site; establishing citizen advisory groups; or obtaining advice from the appropriate regional citizens' advisory committee;

4 Methods of addressing the public's concerns and conveying information to the public;

5 Coordination of public participation requirements. The plan should identify any public participation requirements of other applicable federal, state, or local laws, and address how such requirements can be coordinated. For example, since CERCLA applies to the proposed action, the plan will explain how the CERCLA and MTCA public comment periods will be coordinated; and

6 Amendments to the plan. The plan should outline the process for amending the plan.

groundwater. This will allow targeting of the VOC groundwater plume and placement of monitoring wells in the optimum locations.

2.3.5 Shallow Soil Sampling/Analysis

Shallow soil sampling and analysis is recommended for the sludge and sewage lagoon operable units shown in Figure 2. This sampling is necessary to confirm that surface soils impacted by the previous disposal at those locations have been completely removed. The proposed sampling program for these units calls for approximately 20 discrete samples from each unit. The sample locations will be established with a grid system. To establish background concentrations, approximately 20 discrete background samples will also be collected from the northeast corner of the site. Samples will be analyzed for priority pollutant metals, pesticides/PCBs, radionuclides, and herbicides.

Comparison of the results from each operable unit to the background data will involve a statistically-based evaluation. Specifically, the quantile test (or other similar statistically-based test) will be applied to the data to establish if the results from each operable unit are statistically equivalent to the background data. We believe that the quantile test is the most appropriate approach for this situation and that 20 samples from each area will be adequate for statistical comparison purposes. The quantile test was recently developed by Battelle Pacific Northwest Laboratories through EPA support and is designed for background-based cleanups at Superfund sites (Gilbert and Simpson, 1991).

In the easterly soil unit, soil samples will be collected from a vertical profile to assure that the samples are representative of the surface and near-surface soils potentially disturbed by the agricultural activity. If soil contamination exceeding appropriate cleanup levels and background is discovered, additional sampling to determine the extent of contamination may be necessary.

efforts. Horizontal accuracy will be to the 0.10 of a foot, vertical accuracy for the monitoring wells be to the nearest 0.01 of a foot. Important areas identified in the site history report will also be located with established reference points.

2.3.3 Surface Geophysics

Surface geophysical investigations are planned for the site at locations shown on Figure 1 prior to any subsurface investigations. The purpose of the surface geophysical study is to field verify the survey information collected at closure for the locations of Zones A through E prior to any drilling or soil gas work. With this field verification, drilling and soil gas locations can be established as close as practical to the zones without the risk of drilling into or through a closed cell or buried drums.

After the establishment of a survey grid, a combination of electromagnetics (EM) and magnetics will be used to perform a reconnaissance survey of the boundaries of the closed cells. Interpretation of the data collected by these instruments will be conducted by a consulting geophysicist, and maps will be generated showing boundaries of each cell.

2.3.4 Soil-Gas Investigation

The soil-gas survey for the Pasco Landfill will be used as a rapid sample screening technique for mapping the extent of VOCs in soil and groundwater. This technique is only expected to be suitable adjacent to Zone A and the inactive burn/balefill operable unit where high levels of VOCs are known to be present.

A grid will be established over the area shown in Figure 1 to locate between 24 and 30 sampling points. The soil gas probe will be driven as deep as the geologic conditions will allow. A sample of soil gas will be collected, and analyzed in the field with a gas chromatograph. The concentration of VOCs in the soil-gas will serve as an indirect indication of the VOCs in the

PASCO LANDFILL
SUBSURFACE SOIL SAMPLING/ANALYSIS

Boring	Approx. Sample Depths (ft.)	Subsurface Soil Samples						
		VOC[1]	SVOC[2]	Pest/Pcb[3]	Herbicides[4]	Dioxin	PPM[5]	Radionuclides[6]
B-1 Proposed depth 70 ft.	10-12.5 25-27.5 45-47.5 70-72.5		X				X	
B-2 Proposed depth 70 ft.	10-12.5 25-27.5 45-47.5 70-72.5	X	X				X	
B-3 Proposed depth 70 ft.	10-12.5 25-27.5 45-47.5 70-72.5		X				X	
B-4 Proposed depth 70 ft.	10-12.5 25-27.5 45-47.5 70-72.5		X				X	
B-5 Proposed depth 50 ft.	10-12.5 20-22.5 35-37.5 50-52.5		X		X	X	X	
B-6 Proposed depth 50 ft.	10-12.5 20-22.5 35-37.5 50-52.5		X		X	X	X	
B-7 Proposed depth 40 ft.	10-12.5 20-22.5 30-32.5 40-42.5	X	X	X	X		X	X
B-8 Proposed depth 40 ft.	10-12.5 20-22.5 30-32.5 40-42.5		X	X	X		X	X

[1]VOC - Volatile Organic Compounds — EPA Method 8240
[2]SVOC - Semivolatile Organic Compounds — EPA Method 8270
[3]Pest/PCB - Organochlorine Pesticides/PCBs — EPA Method 8080
[4]Herbicides — EPA Method 8150
[5]PPM - Priority Pollutant Metals — EPA Method 6010
[6]Radionuclides
Gross Alpha-Beta — EPA Method 900.0
Gross Gamma — EPA Method 901.1

2.3.6 Soil Borings Sampling/Analysis

Ten soil borings (including two background borings, B-9 and B-10) will be drilled at the locations shown in Figure 2. These soil borings will be drilled to a depth just above the water table surface as determined by water levels adjacent to monitoring wells. Based on review of the logs of existing wells, it is assumed that all soil borings will be drilled using a hollow stem auger method of drilling. Cuttings generated during drilling operations will be drummed and staged at the site for disposal in accordance with the IWMP. All soil samples will be collected using a split-spoon sampling device at the depths shown in Table 2. Samples are proposed to be analyzed for the parameters listed in Table 2. Based on the results of the data review, these parameters may be modified.

2.3.7 Monitoring Well Installation

Eighteen monitoring wells are proposed for the site at the locations shown on Figure 2. Well locations may vary depending on the results of the soil-gas and geophysical studies. Shallow monitoring wells will be drilled to the approximate depths shown in Table 3 so that screened sections will intercept the water table surface. Based on logs of existing wells drilled at the site, it is assumed that all shallow wells will be drilled using a hollow stem auger method of drilling. Intermediate and deep wells will be nested in separate borings and drilled with a combination of hollow-stem auger/cable tool or air rotary/cable tool. In either case, an oversized conductor casing will be installed first through the Pasco Gravels. Figure 3 shows a typical well nest installation.

The wells will be constructed of 10 feet of 2-inch stainless steel well screen with PVC riser to the surface. An exception to this construction is MW-5, which will be constructed of 5-inch-diameter screen and riser to accommodate aquifer pumping tests. Soil samples will be

PASCO LANDFILL

GROUNDWATER SAMPLING/ANALYSIS

Monitoring Well	Groundwater Samples						
	MFS[1]	VOC[2]	SVOC[3]	Pest/Pcb[4]	Herbicides[5]	PPM[6]	Radionuclides[7]
MW-10 Proposed depth 70 ft.	X	X	X	X		X	
MW-11 Proposed depth 60 ft.	X	X	X	X		X	
MW-12 Proposed depth 77 ft.	X	X	X	X		X	
MW-121 Proposed depth 95 ft.	X	X					
MW-120 Proposed depth 120 ft.	X	X					
MW-13 Proposed depth 70 ft.	X	X	X	X		X	
MW-14 Proposed depth 70 ft.	X	X	X	X		X	
MW-15 Proposed depth 77 ft.	X	X	X	X	X	X	X
MW-16 Proposed depth 50 ft.	X	X	X	X	X	X	X
MW-17 Proposed depth 78 ft.	X	X	X	X	X	X	X

[1]MFS - Minimal Functional Standards
[2]VOC - Volatile Organic Compounds — EPA Method 8240
[3]SVOC - Semivolatile Organic Compounds — EPA Method 8270
[4]Pest/PCB - Organochlorine Pesticides/PCBs — EPA Method 8080
[5]Herbicides — EPA Method 8150
[6]PPM - Priority Pollutant Metals — EPA Method 6010
[7]Radionuclides
Gross Alpha-Beta — EPA Method 900.0
Gross Gamma — EPA Method 901.1

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Table 2, continued

PASCO LANDFILL
SUBSURFACE SOIL SAMPLING/ANALYSIS

Boring	Approx. Sample Depths (ft.)	Subsurface Soil Samples						
		VOC[1]	SVOC[2]	Pest/Pcb[3]	Herbicides[4]	Dioxin	PPM[5]	Radionuclides[6]
B-9 Proposed depth 50 ft.	10 samples - Depths to be determined			X	X		X	X
B-10 Proposed depth 50 ft.	10 samples - Depths to be determined			X	X		X	X
MW-10	60-62.5	X	X	X			X	
MW-11	50-52.5	X	X	X			X	
MW-12	67-69.5	X	X	X			X	
MW-13	60-62.5	X	X	X			X	
MW-14	60-62.5	X	X	X			X	
MW-18	67-69.5	X	X	X			X	X
MW-19	48.5-50	X	X				X	
MW-20	72.5-75	X	X	X			X	
MW-21	66-68.5	X	X	X	X		X	X

[1]VOC - Volatile Organic Compounds — EPA Method 8240
[2]SVOC - Semivolatile Organic Compounds — EPA Method 8270
[3]Pest/PCB - Organochlorine Pesticides/PCBs — EPA Method 8080
[4]Herbicides — EPA Method 8150
[5]PPM - Priority Pollutant Metals — EPA Method 6010
[6]Radionuclides
Gross Alpha-Beta — EPA Method 900.0
Gross Gamma — EPA Method 901.1

PASCO LANDFILL
GROUNDWATER SAMPLING/ANALYSIS

Monitoring Well	Groundwater Samples						
	MFS[1]	VOC[2]	SVOC[3]	Pest/Pcb[4]	Herbicides[5]	PPM[6]	Radionuclides[7]
#5	X	X	X	X	X	X	X
#6	X	X	X	X	X	X	X
#7	X	X	X	X		X	
#8	X	X	X	X	X	X	X
#9	X	X	X	X	X	X	X
EE 2	X	X	X	X		X	
EE 4		X	X		X	X	
EE 5		X	X		X	X	
EE 6		X	X	X		X	
EE 7		X	X	X		X	
EE 8		X	X			X	

[1]MFS - Mimimal Functional Standards
[2]VOC - Volatile Organic Compounds — EPA Method 8240
[3]SVOC - Semivolatile Organic Compounds — EPA Method 8270
[4]Pest/PCB - Organochlorine Pesticides/PCBs — EPA Method 8080
[5]Herbicides — EPA Method 8150
[6]PPM - Priority Pollutant Metals — EPA Method 6010
[7]Radionuclides
Gross Alpha-Beta — EPA Method 900.0
Gross Gamma — EPA Method 901.1

Notes:

Well EE-9 has been damaged and can no longer be sampled.
Wells JUB Control and EE-1 have been replaced with MW-21.
Well EE-3 will be abandoned in accordance with WAC 173-160.

PASCO LANDFILL
GROUNDWATER SAMPLING/ANALYSIS

Monitoring Well	Groundwater Samples						
	MFS[1]	VOC[2]	SVOC[3]	Pest/PcB[4]	Herbicides[5]	PPM[6]	Radionuclides[7]
MW-17I Proposed depth 95 ft.	X	X					
MW-17D Proposed depth 120 ft.	X	X					
MW-18 Proposed depth 77 ft.	X	X	X	X	X	X	X
MW-19 Proposed depth 58 ft.	X	X	X			X	
MW-20 Proposed depth 82 ft.		X	X	X		X	
MW-21 Proposed depth 76 ft.	X	X	X	X	X	X	X
MW-21I Proposed depth 95 ft.	X	X					
MW-21D Proposed depth 120 ft.	X	X					
Existing Wells							
#1	X	X	X	X		X	
#2	X	X	X	X		X	
#3	X	X	X	X		X	
#4	X	X	X	X	X	X	X

[1]MFS - Minimal Functional Standards
[2]VOC - Volatile Organic Compounds — EPA Method 8240
[3]SVOC - Semivolatile Organic Compounds — EPA Method 8270
[4]Pest/PCB - Organochlorine Pesticides/PCBs — EPA Method 8080
[5]Herbicides — EPA Method 8150
[6]PPM - Priority Pollutant Metals — EPA Method 6010
[7]Radionuclides
Gross Alpha-Beta — EPA Method 900.0
Gross Gamma — EPA Method 901.1

2.3.12 Physical Soil Testing

To provide data for later fate and transport evaluations, selected soil samples should be tested for physical and engineering characteristics. These tests will include particle size distribution, Atterberg limits, hydraulic conductivity, particulate organic carbon content, and cation exchange capacity.

2.3.13 Landfill Gas Sampling/Analysis

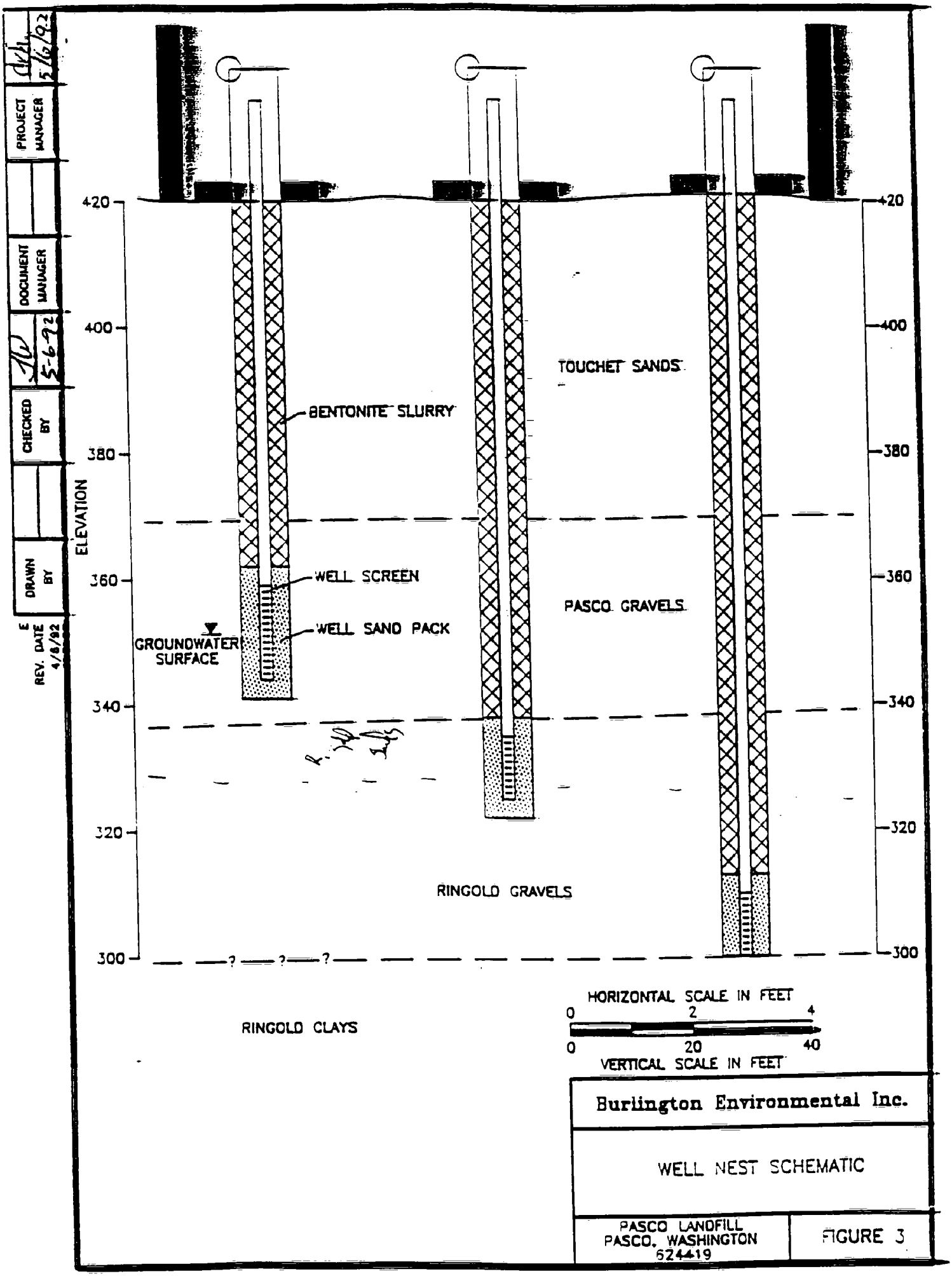
Landfill gas samples should be collected from the landfill gas probes as well as existing perimeter landfill gas probes. Samples will be analyzed for methane, oxygen, nitrogen, hydrogen, carbon dioxide, hydrogen sulfide, and volatile organic compounds. Perimeter probes should also be monitored monthly during field operations for combustible gases.

2.3.14 Ambient Air Sampling/Analysis

A limited number of ambient air samples should be collected and analyzed for the parameters mentioned in the previous landfill gas section. These samples will be used as an initial screening analysis and will be used in the development of the preliminary risk assessment.

2.3.15 Groundwater Modeling/Fate and Transport Analysis

Preliminary analytical or semi-analytical groundwater modeling of site conditions will be undertaken to support the preliminary risk assessment. Models that will account for the impacts from pumping irrigation wells will probably be required.


PROJECT MANAGER
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420
400
380
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ELEVATION
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300
BENTONITE SLURRY
WELL SCREEN
WELL SAND PACK
GROUNDWATER SURFACE
TOUCHET SANDS
PASCO GRAVELS
RINGOLD GRAVELS
RINGOLD CLAYS
? ? ?
HORIZONTAL SCALE IN FEET
0 2 4
0 20 40
VERTICAL SCALE IN FEET
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WELL NEST SCHEMATIC
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PASCO, WASHINGTON
624419
FIGURE 3

collected during the drilling of the groundwater monitoring wells proposed for the site. Approximate depths and proposed laboratory analyses are listed in Table 2. Analytical parameters may be modified after the data review task is completed. All cuttings generated during drilling operations will be drummed and staged on site for later disposal.

Monitoring well EE-3 was originally drilled using hollow-stem auger techniques through landfill debris. Due to concerns that auger "drag down" may be contributing to the VOC contamination evident in this well, EE-3 will be abandoned in accordance with WAC 173-160. In addition, any wells found to be damaged beyond repair during the data review and site visit will be recommended for proper abandonment.

2.3.8 Landfill Gas Probe Installation

Nested landfill gas probes will be installed at two locations along the western boundary of the solid waste landfill. These probes will consist of a single boring with a triple completion of 0.5 to 0.75-inch PVC screens and risers. The 5-foot screen sections will be placed at depths of 10 to 15 feet, 25 to 30 feet and 40 to 45 feet to monitor any landfill gases. A bentonite seal will be placed just above each screen section to effectively isolate each screened section. Soil samples will be collected at 5-foot intervals in order to characterize the geology at each boring. Actual depth of the screened interval may vary in the field based on geologic conditions encountered during drilling of each boring.

2.3.9 Groundwater Sampling/Analysis

Upon completion of the monitoring well installation, all 33 monitoring wells at the site (18 new and 15 existing wells) will be sampled. Table 3 outlines the analytical parameters to be run on each of the groundwater samples. Prior to sample collection each well will be purged

2.3.16 Preliminary Risk Assessment

The preliminary risk assessment will be conducted as part of this investigation. This assessment will consist of an evaluation of the plausibility of the potential exposure pathways, including consumption of agricultural products irrigated with contaminated groundwater or grown in contaminated soil. It will also identify any data gaps that need to be addressed. To streamline the risk assessment effort, all data generated from the investigation will be entered into a database management computer program following standard procedures outlined in the Data Management Plan.

2.3.17 Reporting

A Phase I Remedial Investigation Report will be produced when all data from the field investigation has been received. This preliminary draft report is only for submittal to the members of the Pasco Landfill PLP Group. After comments are received from the PLP members they will be incorporated into a Draft Phase I Remedial Investigation Report that will be submitted to Ecology. Comments from Ecology will be incorporated into the final report. Other deliverables to Ecology will include the work plan (including SAP, Health and Safety Plan, and Public Participation Plan) and monthly progress reports. Following completion of the Phase I Remedial Investigation, a scope of work for the completion of the Remedial Investigation and the Feasibility Study will be prepared.

2.3.18 PLP Meetings

It is anticipated that two meetings with the PLP Group will be required. The first meeting will be to present the Draft Workplan prior to commencing field work; the second will be to discuss the Draft Phase I Remedial Investigation Report prior to submitting the Draft Report to Ecology. Other meetings with Ecology may be required.

3 PROJECT SCHEDULE

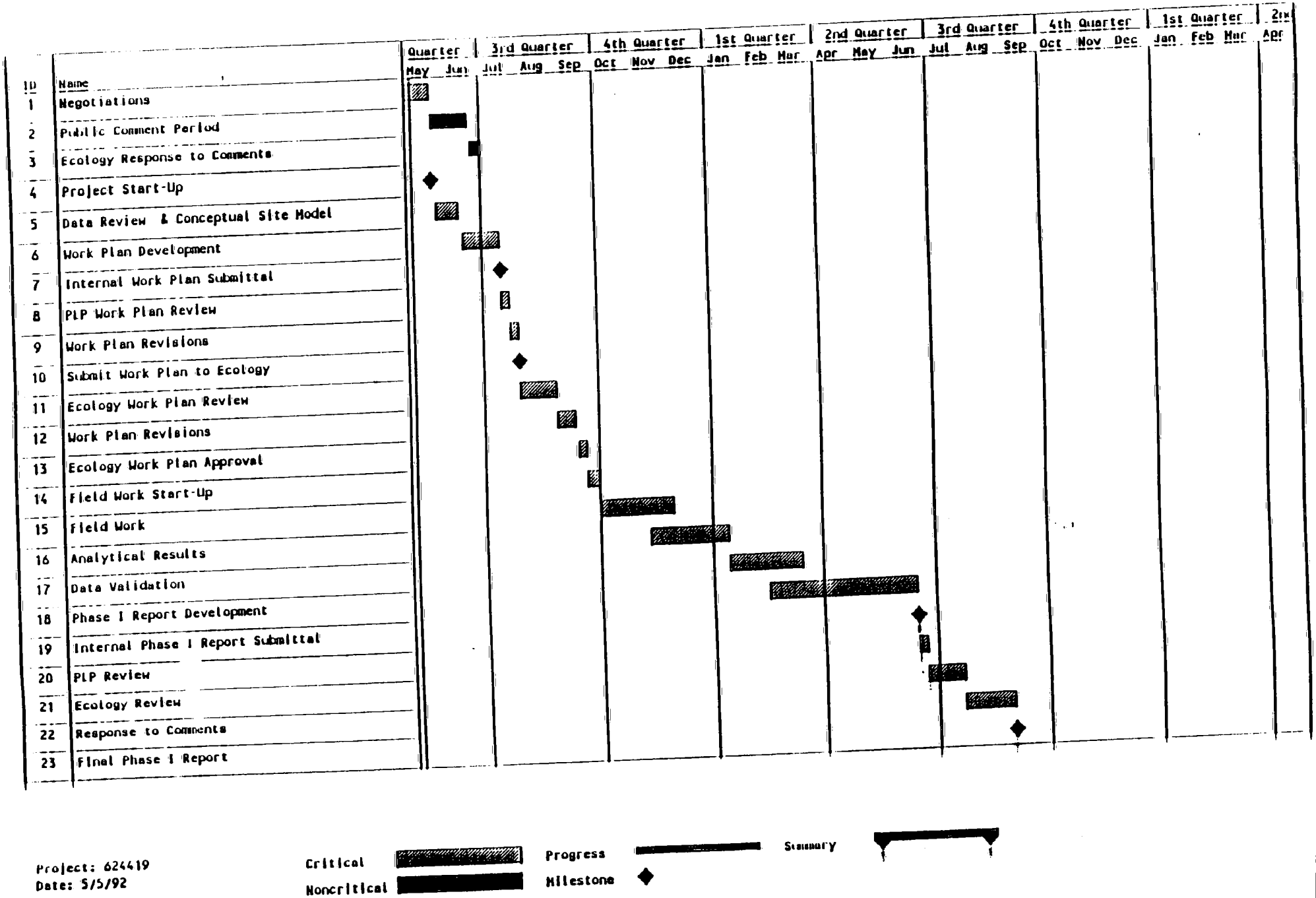
The proposed project schedule is presented in Figure 4. It is anticipated that Burlington will be under contract to the PLP Group by May 20, 1992, and will commence additional work at that time. During late May and early June existing data will be gathered and reviewed and a conceptual site model will be prepared.

Project planning documents will be prepared in June and July. A PLP Group meeting is anticipated to occur in mid to late July to discuss the work plan and the scope of work for the remedial investigation. Field work is expected to begin by October and continue into early December.

Report evaluation will begin in mid February 1993 and continue into early June 1993 when the Preliminary Risk Assessment and the preliminary draft Phase I Remedial Investigation Report will be completed. Following review of these documents, a PLP Group meeting will be held to discuss results of the investigation. The final reports are expected to be completed by late August 1993.

Figure 4

Pasco Landfill Investigation
Project Schedule



REFERENCES

Gilbert, R.O. and Simpson, Jeanne C., 1990. Statistical Sampling and Analysis Issues and Needs for Testing Attainment of Background-Based Cleanup Standards at Superfund Sites. presented at the USEPA Workshop on Superfund Hazardous Waste, February 1990.

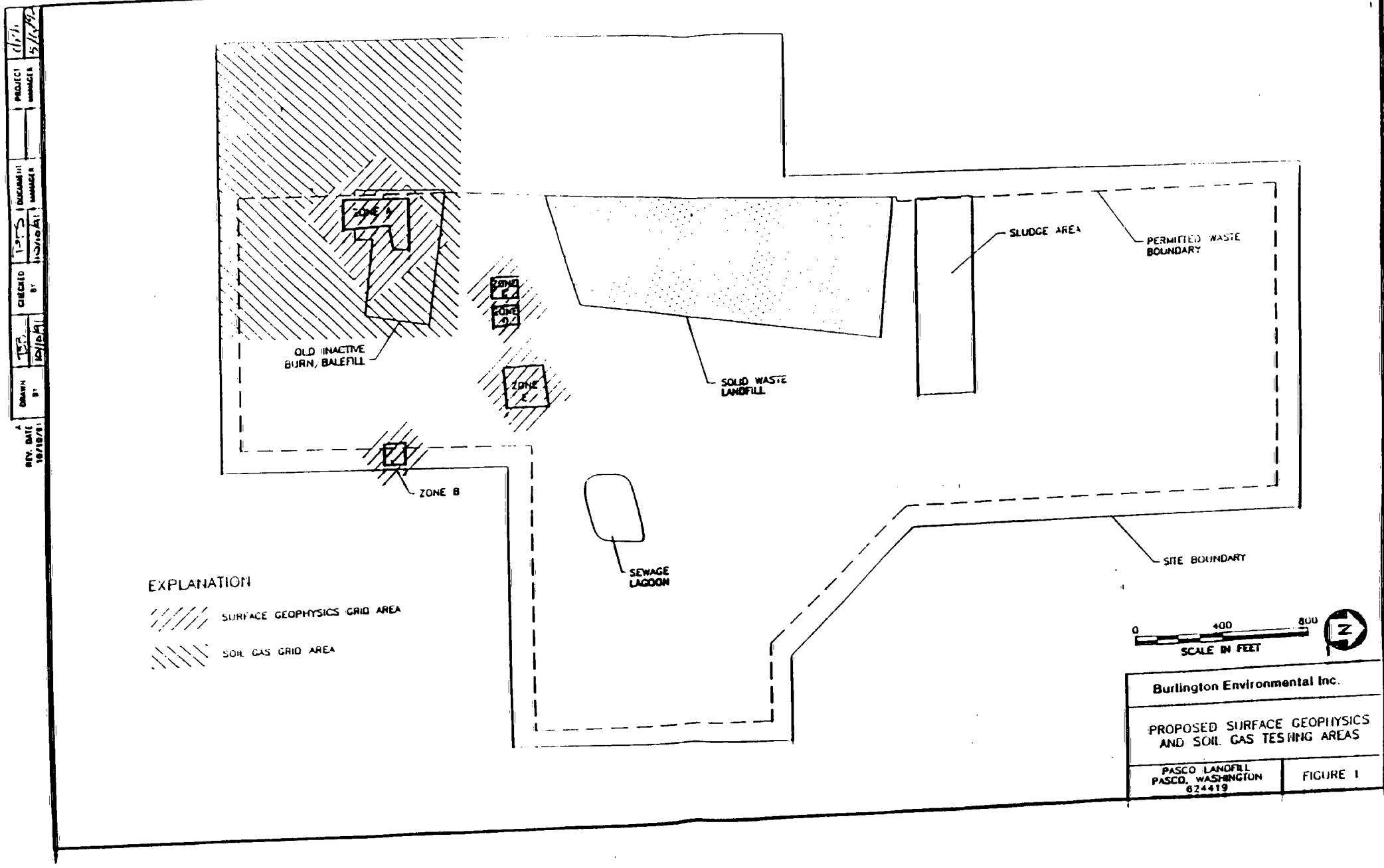
U.S. Environmental Protection Agency, 1991. Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites, Office of Emergency Remedial Response, EPA/540/P-91/001, February 1991.

U.S. Environmental Protection Agency, 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final, EPA/540/6-88/003, December 1988.

U.S. Environmental Protection Agency, 1985. Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites.

U.S. Environmental Protection Agency, 1979. Water-Related Environmental Fate of 129 Priority Pollutants, EPA/440/4-79/029A, December 1979.

Washington State Department of Ecology, 1991. Cleanup Information Memorandum No. 91-1, Groundwater Data Submittals, Memo from Carol Fleskes, Program Manager, Toxics Cleanup Program, July 12, 1991.



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PROPOSED SURFACE GEOPHYSICS AND SOIL GAS TESTING AREAS

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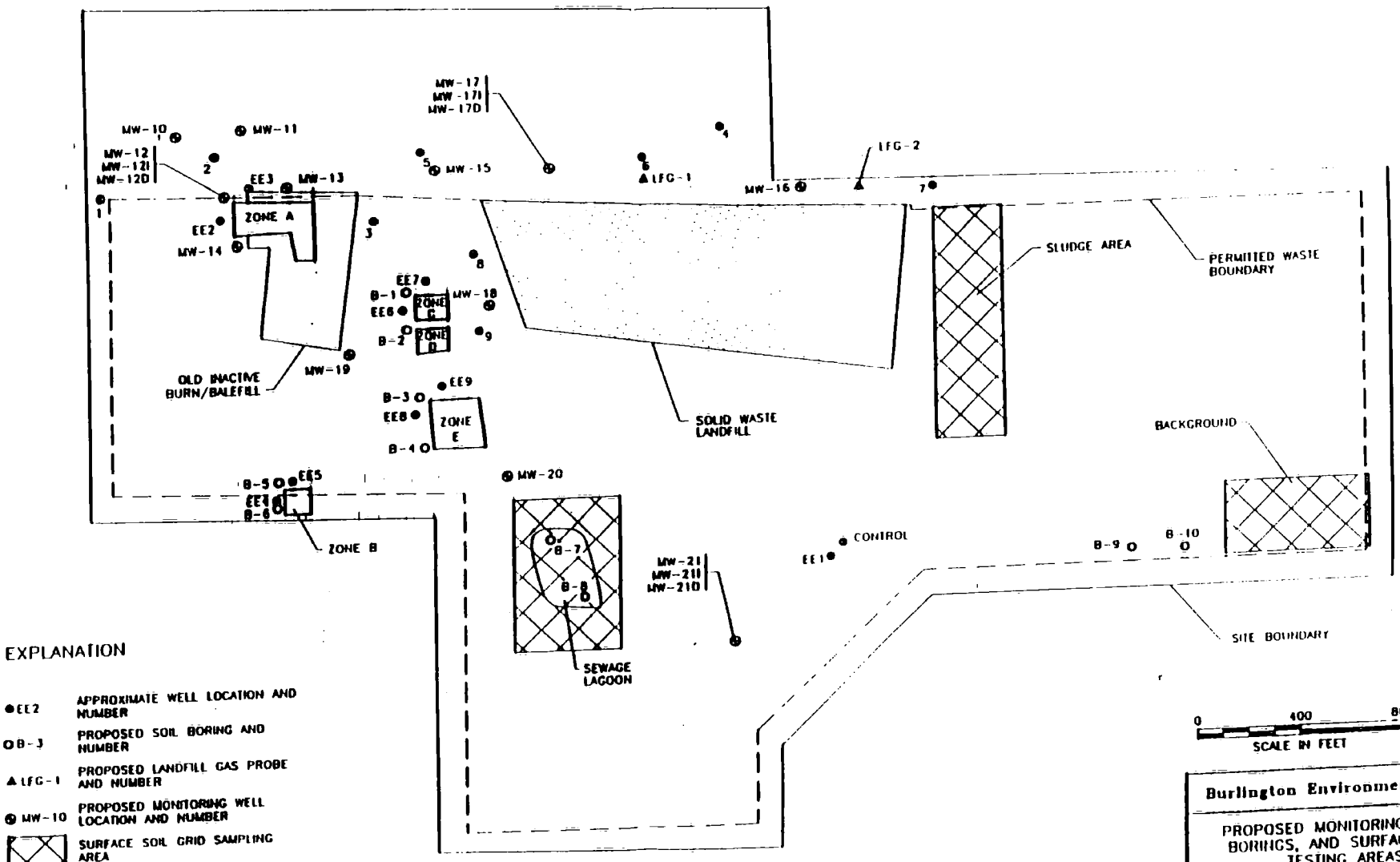
FIGURE 1



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PROPOSED MONITORING WELLS, BORINGS, AND SURFACE SOIL TESTING AREAS

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FIGURE 2